Volunteer Lake Assessment Program Individual Lake Reports

ROBINSON POND, HUDSON, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	832	**Max. Depth (m):**	9	**Flushing Rate (yr^{-1}):**	1.3
Surface Area (Ac.):	88	**Mean Depth (m):**	3.3	**P Retention Coef:**	0.68
Shore Length (m):	2,900	**Volume (m^3):**	1,189,000	**Elevation (ft):**	211

TROPHIC CLASSIFICATION

Year	Trophic class
1979	EUTROPHIC
1988	MESOTROPHIC

KNOWN EXOTIC SPECIES

Variable Milfoil
Fanwort

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

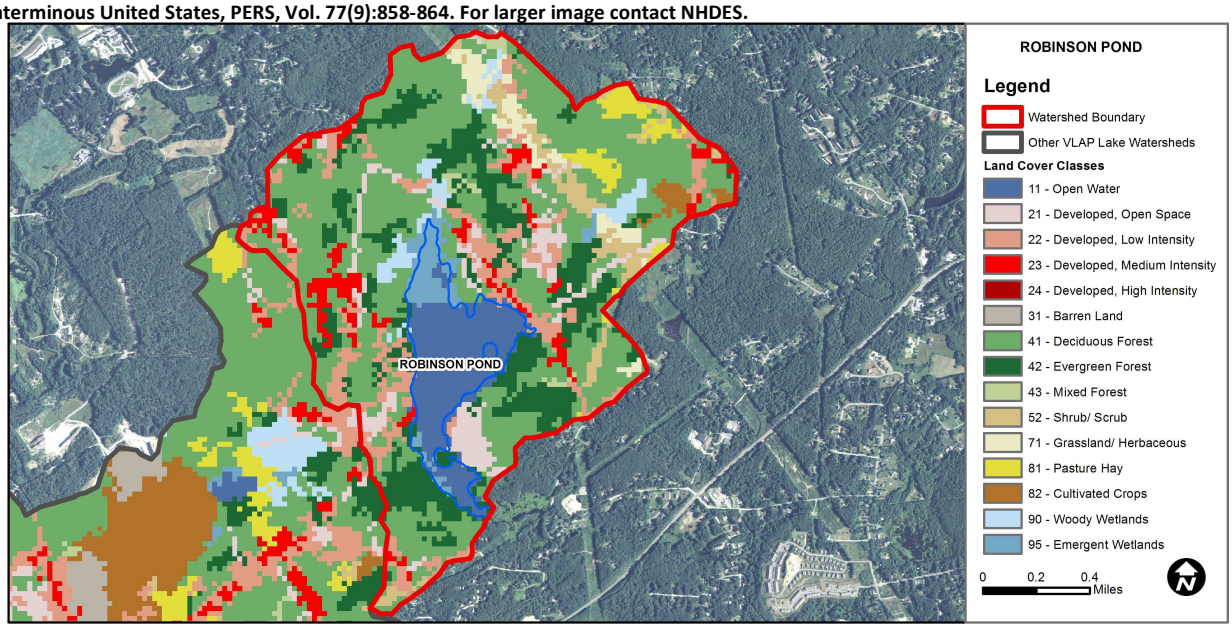
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	>/=5 samples and median is >threshold.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	D.O. (% sat)	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Chlorophyll-a	Slightly Bad	>5 samples and median is > threshold.
Primary Contact Recreation	E. coli	Bad	>/=1 exceedance(s) of geometric mean criterion and/or >/=2 exceedances of single sample criterion, with 1 or more >2X criteria.
	Cyanobacteria	Slightly Bad	Cyanobacteria bloom(s).
	Chlorophyll-a	Bad	>10%, with a minimum of 2, samples exceed criteria, with 1 or more by a large margin.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

ROBINSON POND - CAMP WINAHUPE BEACH	E. coli	No Data	No Data for this parameter.
ROBINSON POND - TOWN BEACH	E. coli	Bad	>/=1 exceedance(s) of geometric mean criterion and/or >/=2 exceedances of single sample criterion, with 1 or more >2X criteria.
ROBINSON POND - TOWN BEACH	Cyanobacteria	Bad	Cyanobacteria bloom(s).

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



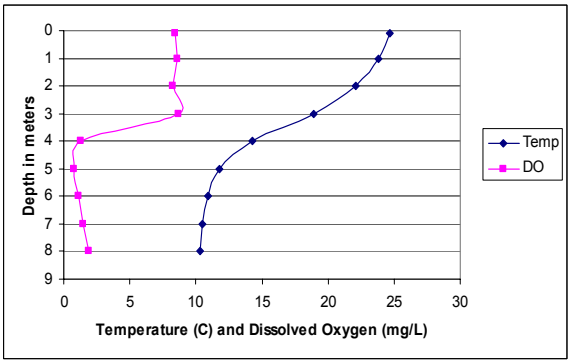
Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	8.96	Barren Land	0	Grassland/Herbaceous	2.54
Developed-Open Space	5.36	Deciduous Forest	41.72	Pasture Hay	2.24
Developed-Low Intensity	9.13	Evergreen Forest	15.64	Cultivated Crops	0.88
Developed-Medium Intensity	4.33	Mixed Forest	0.64	Woody Wetlands	2.29
Developed-High Intensity	0	Shrub-Scrub	3.66	Emergent Wetlands	2.63

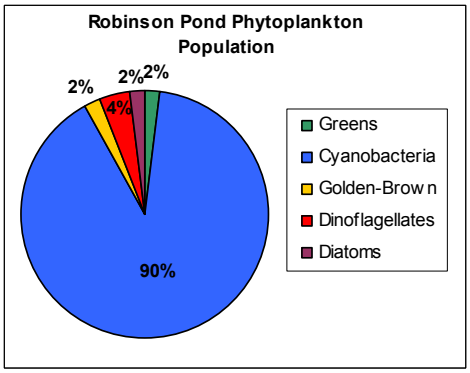
VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
ROBINSON POND, HUDSON, NH
2012 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphic)*

- **CHLOROPHYLL-A:** Chlorophyll levels were elevated throughout the summer, particularly in August where levels were indicative of an algal or cyanobacteria bloom. Historical trend analysis indicates chlorophyll levels fluctuate from year to year.
- **CONDUCTIVITY/CHLORIDE:** Conductivity and chloride were generally elevated and greater than the NH lake medians at all stations. This is indicative of the developed watershed around the pond.
- **E. COLI:** E. coli levels in Sta 6 and Sta 7 were elevated after a significant rain event in June. The turbidity was also elevated in the Sta 7 sample. These stations have a history of elevated and fluctuating E. coli levels likely from natural wildlife or domestic animal sources that are washed into the tributaries during heavy rain events.
- **TOTAL PHOSPHORUS:** Epilimnetic (upper water layer) phosphorus levels were slightly above average throughout the summer and greater than the NH lake median. Historical trend analysis indicates a relatively stable epilimnetic phosphorus level. Metalimnetic (middle water layer) phosphorus was elevated from June through August. Hypolimnetic (lower water layer) phosphorus was elevated throughout the summer due to the release of phosphorus from the sediments during anoxic conditions. Phosphorus was elevated in Sta 5 and 6 in May, and turbidity was also elevated, likely due to low flow conditions. Phosphorus was elevated in Sta 2, 3, 6 and 7 in June following a significant rain event.
- **TRANSPARENCY:** Transparency was relatively stable throughout the summer and improved slightly from 2011. Historical trend analysis indicates a significantly decreasing (worsening) transparency since monitoring began.
- **TURBIDITY:** Epilimnetic turbidity was elevated in August as a result of the algal bloom. Metalimnetic turbidity was elevated in June, also due to algal growth. Hypolimnetic turbidity was elevated from July through September likely due to the formation of organic compounds during anoxic conditions. Turbidity at Sta 5 was elevated in May, and at Sta 5, 6 and 7 in June due to both low flow conditions and a significant rain event.
- **PH:** pH decreases to undesirable levels in the metalimnion and hypolimnion.
- **RECOMMENDED ACTIONS:** Stormwater runoff from watershed development is impacting tributaries and the pond. Stormwater volume and intensity is increased by the amount of impervious surfaces which causes stormwater erosion of unstable sediments and carries additional pollutants into the tributaries. It is recommended to perform a watershed survey to identify culverts, storm drains, areas of erosion and other potential pollutant loads, and then prioritize areas to implement stormwater best management practices. The approved Robinson Pond TMDL identifies the pond sub-watersheds and estimates their nutrient loads. The two major contributors are the Direct Drainage (Sta 6 and 7) and the Launch Brook (Sta 2) sub-watersheds. It is possible to apply for Section 319 grant funding to develop a watershed management plan and fund implementation projects to reduce nutrient loading.

Dissolved Oxygen & Temperature Profile





NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

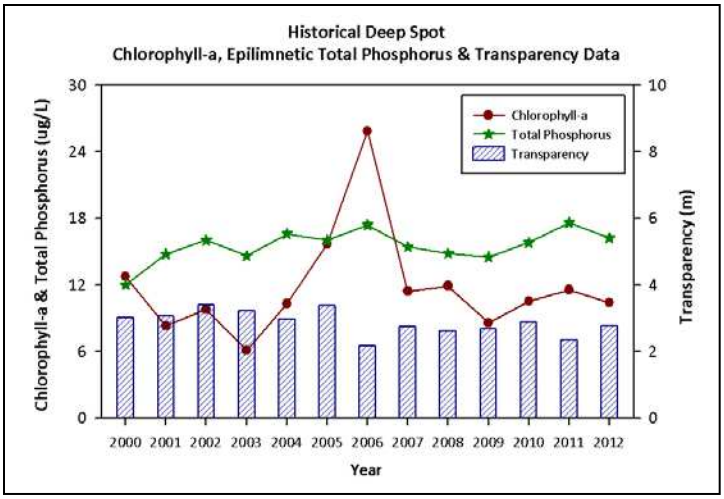
NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

Table 1. 2012 Average Water Quality Data for ROBINSON POND

Station Name	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m	Turb. ntu	pH
							NVS		
Deep Epilimnion	17.2	10.4	29	179.3		16	2.77	3.38	7.07
Deep Metalimnion				179.6		29		2.60	6.62
Deep Hypolimnion				194.4		59		15.1	6.48
Sta 2 Launch Brook			31	221.0	70	45		1.60	7.14
Sta 3 Howard Brook			13	117.4	50	67		3.32	6.22
Sta 4 Juniper Brook			29	205.0	10	20		0.70	6.51
Sta 5 Stoney Lane			19	195.0	55	69		16.9	6.50
Sta 6 Woodcrest Brook			44	224.5	195	265		3.65	6.21
Sta 7 Row			44	260.5	270	311		14.6	6.35

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation
Chlorophyll-a	Variable	Data fluctuate annually, but are not significantly increasing or decreasing.
Transparency	Degrading	Data significantly decreasing (worsening).
Phosphorus (epilimnion)	Stable	Data not significantly increasing or decreasing.



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